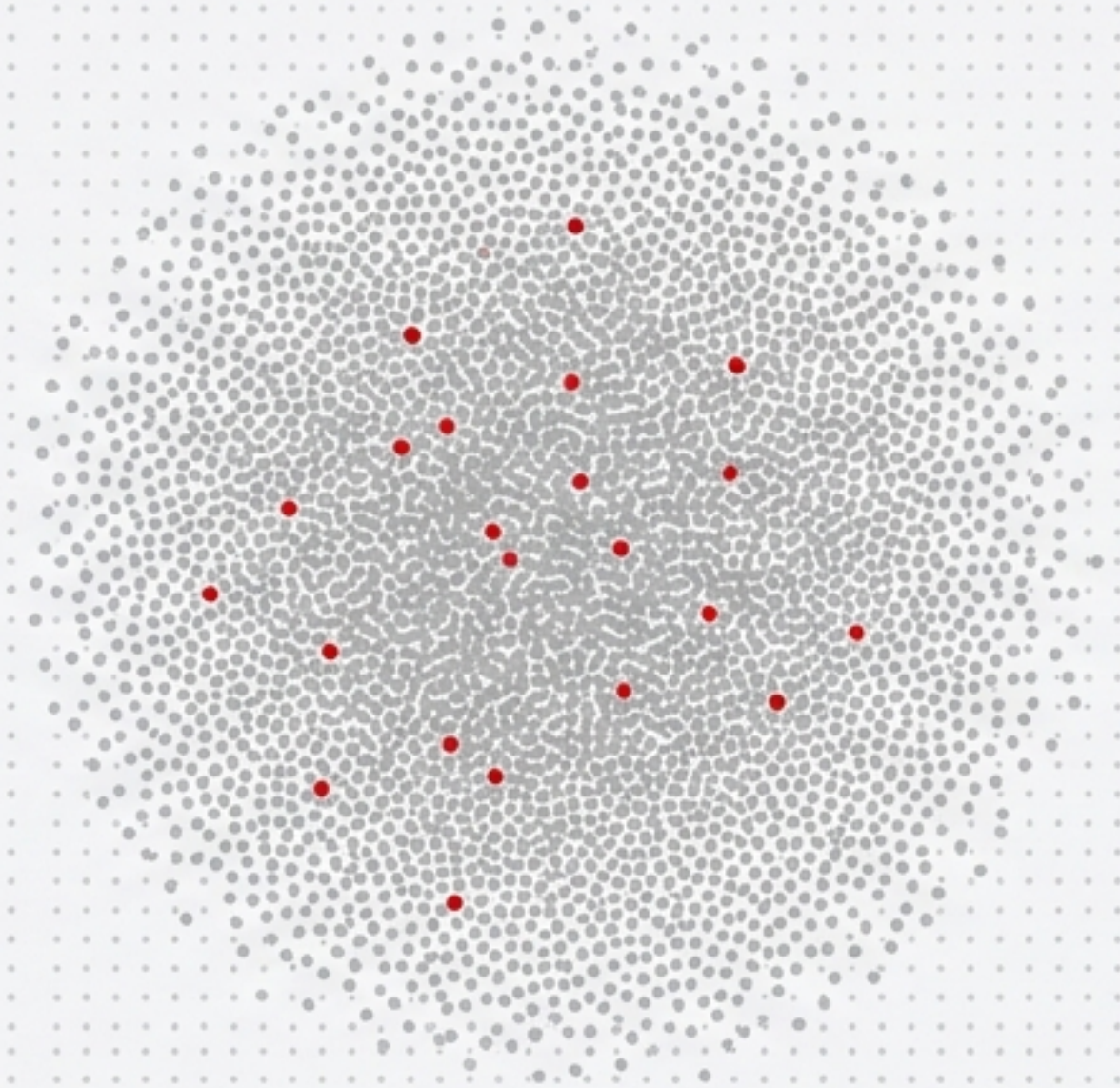


1-Year Risks of Cancers Associated with COVID-19 Vaccination

A Population-Based Retrospective Cohort Study of 8.4 Million Individuals in South Korea (2021-2023)

Kim et al., Biomarker Research (2025) 13:114

STATUS UPDATE: Editorial Concern Issued Oct 22, 2025. This article is currently under investigation by the editors.



Executive Summary

Objective

To estimate cumulative incidences and subsequent risks of overall cancers 1 year after COVID-19 vaccination, addressing the lack of real-world data on oncogenic potential in large populations.

Methodology

Retrospective analysis of the Korean National Health Insurance Service (NHIS) database. Utilized 1:4 Propensity Score Matching (PSM) to compare **Unvaccinated (n=595,007)** vs. **Vaccinated (n=2,380,028)**.

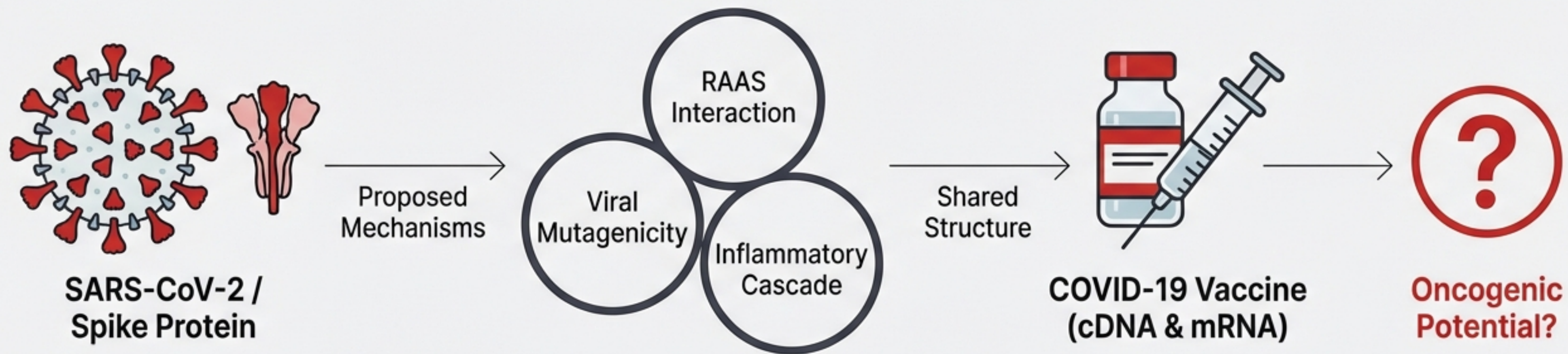
Key Findings

Identified **statistically significant increased risks** for 6 specific cancer types: Thyroid, Gastric, Colorectal, Lung, Breast, and Prostate. Risks varied significantly by vaccine platform (mRNA vs. cDNA), age, and sex.

Status Note

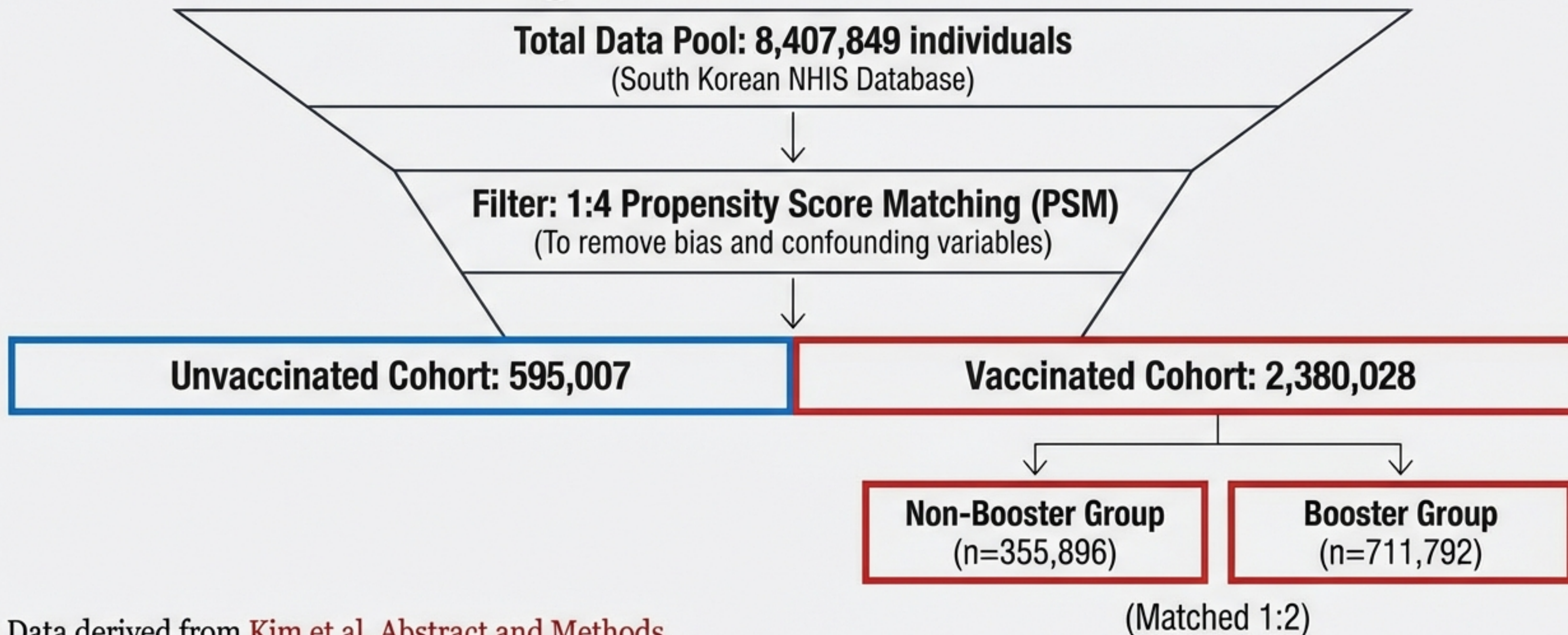
Findings are preliminary. Editorial concerns regarding the validity of the article have been raised by the publisher as of October 2025.

The Hypothesis: Viral Oncogenicity and Spike Proteins



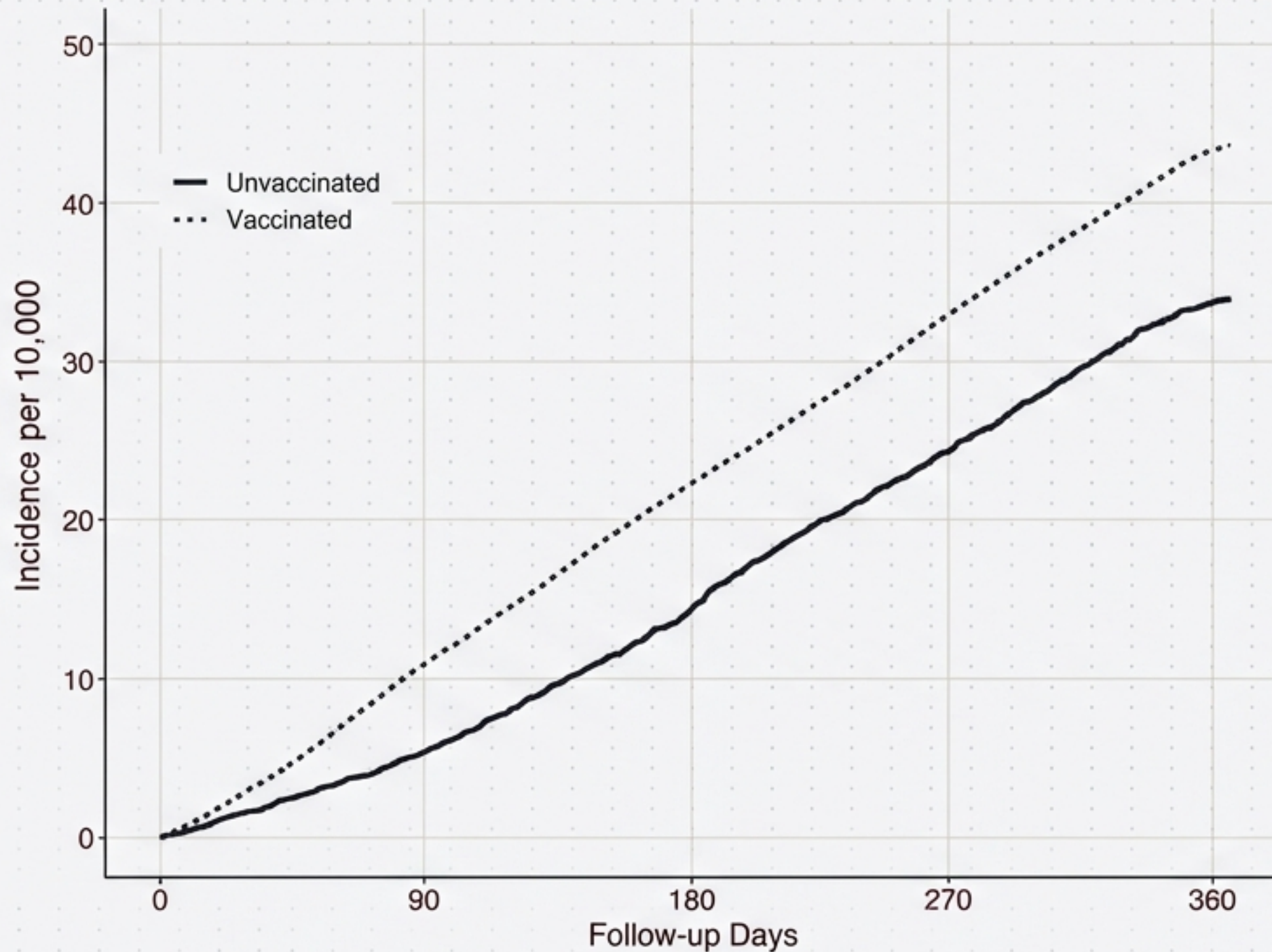
Context: SARS-CoV-2 shares oncogenic potential with viruses like HPV and Epstein-Barr. The study investigates whether vaccines utilizing the shared spike protein structure carry similar risks driven by vaccine-induced hyperinflammation.

Cohort Selection & Propensity Score Matching



Data derived from Kim et al. Abstract and Methods.

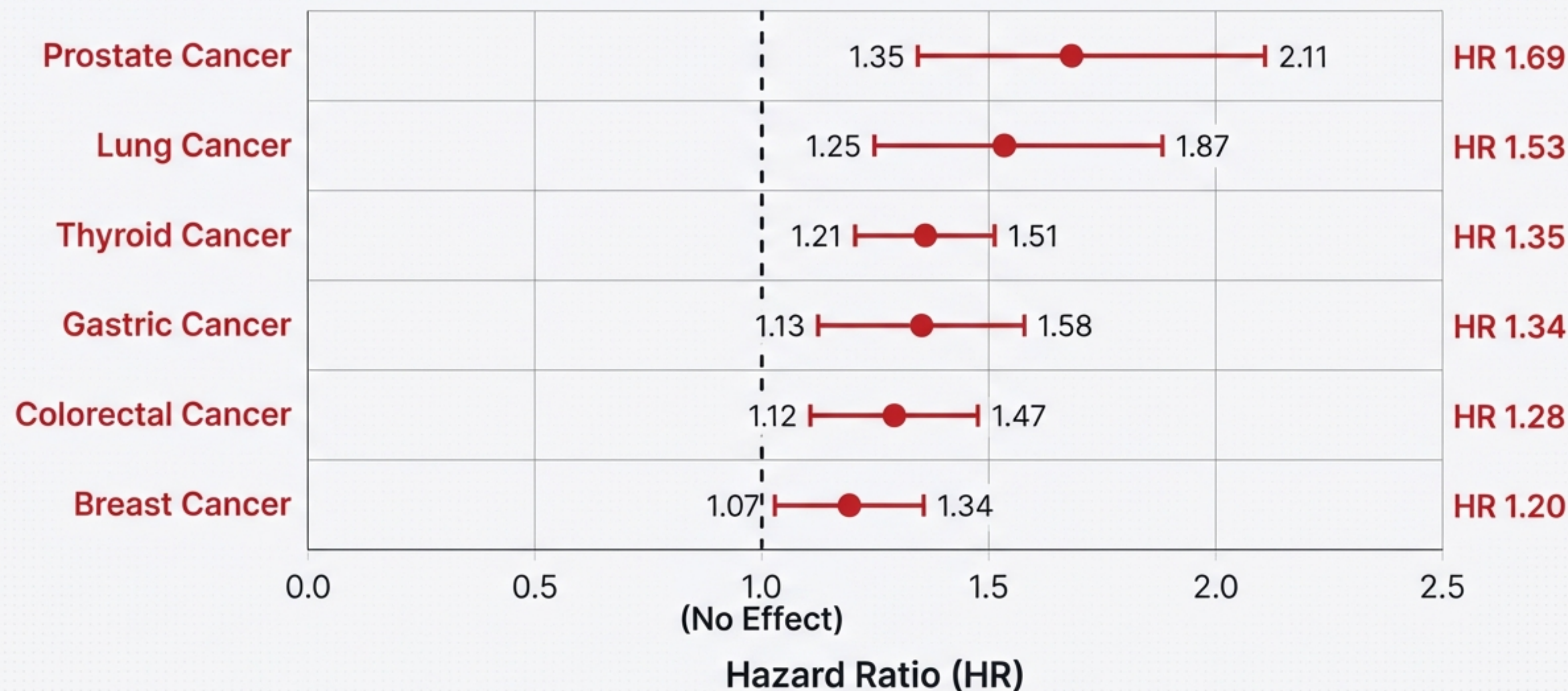
Primary Signal: Cumulative Incidence of Overall Cancer



Log-rank test
 $P < 0.001$

At 1-year post-vaccination, the vaccinated cohort showed a statistically significant higher cumulative incidence of cancer compared to the unvaccinated control.

The Six Specific Risk Signals (Hazard Ratios)



All HRs represent risk at 1-year post-vaccination. Error bars represent 95% Confidence Intervals. Refer to Figure 1A.

Risk Stratification by Vaccine Platform

cDNA (Viral Vector)	mRNA	Heterologous (Mixed)
- Thyroid - Gastric - Colorectal - Lung - Prostate Broader range of associated cancers.	- Thyroid - Colorectal - Lung - Breast	- Thyroid - Breast

Demographic Signals: Vulnerability by Sex

Male Cohort



Higher relative vulnerability observed in:

Gastric Cancer
Lung Cancer

Female Cohort



Higher relative vulnerability observed in:

Thyroid Cancer
Colorectal Cancer

Demographic Signals: Vulnerability by Age

Age ≤ 65 Years

Identified as the '**likely more elevated**' risk group for most observed cancers.

- Thyroid Cancer
- Breast Cancer

Age ≥ 75 Years

- Prostate Cancer

*“Notably, this COVID-19 vaccination-associated cancer risk was **likely more elevated** among individuals **aged ≤ 65 years** except in individuals with prostate cancer.”*

The Booster Effect (Re-exposure)

Pancreatic Cancer

HR 2.25

(95% CI: 1.44–3.50), $P < 0.001$

Substantial increase in booster group.

Gastric Cancer

HR 1.23

(95% CI: 1.01–1.50), $P = 0.041$

Clinical Advisory

Clinicians should prioritize monitoring the risk of gastric cancer in relation to COVID-19 booster doses.

Counter-Signals: Decreased or Null Associations

Decreased Risk (HR < 1.0)	No Significant Association
Leukemia: HR 0.56 ($P = 0.020$)	Oral Cancer
Myeloma: HR 0.58 ($P = 0.080$)	Kidney Cancer
	Bladder Cancer
	Hodgkin Lymphoma

Insight: The proposed ‘hyperinflammation’ hypothesis does not universally exacerbate all oncogenic processes; signals were specific to the 6 identified types.

Study Limitations & Interpretative Caution

Retrospective Nature

The study establishes epidemiological association, not direct causality. Confounding factors may exist despite matching.

Short Duration

Analysis covers only 1-year post-vaccination. Long-term oncogenic effects remain unknown.

Missing Mechanism

While 'hyperinflammation' is proposed, the study did not isolate molecular proof of the mechanism in these specific patients.

Population Specificity

Data is from the Korean NHIS; results may vary in populations with different genetic backgrounds or vaccine protocols.

Authors' Conclusions

COVID-19 vaccination is associated with increased risks for **Thyroid, Gastric, Colorectal, Lung, Ling, Breast, and Prostate** cancers.

Risk is Non-Uniform and depends on: Vaccine Type | Age | Sex.
Risk Dependencies (0.5pt)

Call to Action: Further research is warranted to determine if specific vaccination strategies should be tailored to specific populations to minimize **oncogenic risk**.

Critical Context: Editorial Concern

22 October 2025

Readers are alerted that concerns with this article have been raised with the Editors. Editorial action will be taken as appropriate once the concerns have been fully investigated.

Source: Springer Nature / Biomarker Research

Implication: While the data provides a strong signal, the integrity of the methodology or data interpretation is currently under peer scrutiny. These findings should be treated as preliminary and subject to potential revision.

Summary of “At Risk” Profiles

Younger (≤ 65)	Older (≥ 75)	Boosted
Thyroid, Breast	Prostate	Gastric, Pancreatic

Full Citation: Kim, H., Kim, MH., Choi, M. et al. "1-year risks of cancers associated with COVID-19 vaccination: a large population-based cohort study in South Korea." Biomarker Research 13, 114 (2025).
DOI: <https://doi.org/10.1186/s40364-025-00831-w>
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Editorial Concern Flagged